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## EUROPEAN PATENT APPLICATION

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(54) Colouring shampoo.

(57) A shampoo composition for treating hair, comprising a  
anionic shampoo base, auxiliary surfactant, and a direct dye,  
useful in dyeing natural fibres, and in particular for dyeing  
human hair.

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## COMPOSITIONS

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14 The invention relates to dye compositions useful in  
15 dyeing natural fibres, and in particular for dyeing  
16 human hair.

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18 Direct dyes are commonly used to colour fibrous  
19 materials, for instance human hair, for a limited time,  
20 and are particularly useful when repeated changes in  
21 colour are required. However, direct dyes often impart  
22 a low colour intensity to a substrate and safety  
23 considerations may prevent the use of more concentrated  
24 compositions .

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26 It has now been found that the colour intensity of  
27 direct dyes deposited from shampoo-based compositions  
28 can be increased by the use of auxiliary surfactants,  
29 the auxiliary surfactant facilitating higher deposition  
30 of dye onto the substrate.

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32 Accordingly, the present invention provides a dye  
33 composition for treating hair, comprising an  
34 anionic shampoo base, auxiliary surfactant, and a  
35 direct dye.

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03 Suitably, the direct dye is an anthraquinone, azo,  
04 nitro such as for example a nitrophenylene diamine,  
05 basic, triarylmethane, or disperse dye, or any  
06 combination thereof.

07 Anionic shampoo bases comprise a major proportion of  
08 an anionic surfactant (hereinafter the 'primary  
09 surfactant') and may optionally include additional  
10 surfactants (hereinafter the 'secondary surfactants')  
11 which may be anionic, non-ionic, or cationic  
12 surfactants to modify the cleaning, foaming and  
13 conditioning properties of the shampoo base.

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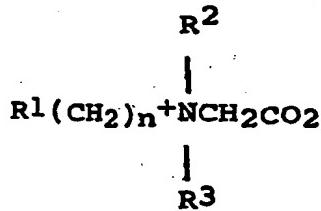
15 The auxiliary surfactant is a cationic or betaine  
16 surfactant, or is a mixture of such surfactants.

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18 Suitable primary surfactants for use in the  
19 compositions of the invention include, sodium and  
20 ammonium lauryl sulphates, sodium and ammonium lauryl  
21 ether sulphates, sodium olefin sulphonates, substituted  
22 ammonium lauryl sulphates and substituted ammonium  
23 lauryl ether sulphates, fatty acid alkanolamide  
24 sulphosuccinates and fatty acid sarcosinates.

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26 Suitable betaine surfactants include compounds of the  
27 formula:-



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35 wherein;

36 R<sup>1</sup> is a C<sub>10-18</sub> alkyl group or a C<sub>9-17</sub> alkyl  
37 carboxylimino group;

03 R<sup>2</sup> is a C<sub>1</sub>-3 alkyl group or a hydroxy C<sub>1</sub>-3 alkyl  
04 group;

05 R<sup>3</sup> is a C<sub>1</sub>-3 alkyl group or a hydroxy C<sub>1</sub>-3 alkyl  
06 group;

07 and n is an integer from 1 to 5.

08 Suitable nonionic secondary surfactants include fatty  
09 acid alkanolamides, polyalkoxylated fatty acid amides,  
10 polyalkoxylated sorbitan esters of long chain fatty  
11 acids, polyalkoxylated long chain alkylamine oxides and  
12 amido amine oxides of long chain fatty acids may also  
13 be used.

14 Suitable cationic secondary or auxiliary surfactants  
15 include polyethoxylated quaternary ammonium compounds,  
16 quaternised guar gum derivatives, quaternised cellulose  
17 derivatives, synthetic polymers formed by the  
18 condensation of polyglycols with polyamines, also  
19 polymers formed by combining vinyl pyrrolidone units  
20 with dimethylamine ethyl methacrylate units and homo  
21 polymers of dimethyl diallyl ammonium chloride.

22 Preferably, the betaine surfactant is a cocamido alkyl  
23 betaine such as cocamido propyl betaine.

24 The shampoo base may be present in the composition of  
25 the invention from 0.1 to 50% by weight of the  
26 composition. Preferably, the shampoo base comprises  
27 from 5 to 20% by weight of the composition.

28 The total auxiliary surfactant may be present in the  
29 composition of the invention from 0.1 to 50% by weight  
30 of the composition. Preferably, the auxiliary  
31 surfactant comprises from 0.1 to 15% by weight of the  
32 composition.

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When the auxiliary surfactant comprises a betaine surfactant, the betaine surfactant is suitably present in an amount of from 1 to 10% by weight of the composition.

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When the auxiliary surfactant comprises a cationic surfactant, the cationic surfactant is suitably present in an amount of from 1 to 5% by weight of the composition.

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The dye or when a mixture of dyes is used, each dye may be present in the composition of the invention at from 0.01 to 5% by weight, preferably 0.01 to 3%.

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Total dye content being in the range 0.01 to 10% by weight of the composition.

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In a preferred aspect the present invention provides a shampoo composition comprising:

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from 0.01% to 10% by weight of a direct dye;

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from 0.1% to 50% by weight of an anionic surfactant; and

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from 0.1% to 50% by weight of a cationic surfactant; and/or

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from 0.1% to 50% of a betaine surfactant .

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It is to be understood that the cationic surfactant in the above composition may be part of the anionic shampoo base or the auxiliary surfactant or both.

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Dye compositions of the invention may comprise conventional ancillary ingredients such as conditioning agents, opacifiers, pearlescent agents, sequestrants, perfumes, preservatives, glycols, water.

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The pH of the compositions of the invention suitably may be from 4 to 10, preferably from 5 to 8. If necessary the pH may be adjusted using conventional agents.

The present invention also provides a process for the preparation of a dye composition, which process comprises the following main steps:

- a. preparing the anionic shampoo base by admixing the primary surfactant and if required any secondary surfactant with water at ambient or slightly elevated temperature;
- b. admixing the auxiliary surfactant, pre-dissolved in water if necessary, and the anionic shampoo base at ambient or slightly elevated temperature;
- c. adding the direct dye;
- d. and finally adjusting the pH of the composition to within the range of from 4 to 10, preferably from 5 to 8.

Further toiletries additives may be added at any convenient stage in the process preferably before final pH adjustment.

The direct dye may be in dry powder form or may be predispersed, suspended or dissolved in a suitable solvent, preferably a glycol, for example glycerin or propylene glycol.

The invention further provides a method for treating non-human or human hair comprising applying an effective, non-toxic amount of a composition as hereinbefore defined to the hair.

03 Th compositions of the invention will now b  
04 illustrated by way of the following Example.

05  
06 Example

	<u>% by weight</u>
*Monoethanolamine lauryl ether sulphate	8.75
*Polyoxyethylene (3) lauramine oxide	1.00
Cocamido propyl betaine	4.50
*Glycerin	4.50
2-Nitro-p-phenylene diamine	0.40
*Preservatives, perfume, etc.	qs
*Water	qs 100.0

17 \* = conventional anionic shampoo base

18  
19 Comparative Tests

20 A number of test formulations were prepared together  
21 with a corresponding number of control formulations in  
22 which the auxiliary surfactant was omitted. A number  
23 of hair tresses were prepared using light brown virgin  
24 human hair, each tress of hair (1g) being bound with  
25 waxed twine.

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Test Formulations

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Formulation 1

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Weight Percent

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08	Ammonium lauryl ether sulphate	12.0
09	Polyoxyethylene (20) Sorbitan mono-oleate	4.0
10	**Cocamido propyl betaine	4.0
.1	Glycerin	4.5
.2	2-Nitro-p-phenylene diamine	0.3
.3	4-Nitro-o-phenylene diamine	0.3
.4	Perfume	qs
.5	Preservatives	qs
.6	Deionised water	qs to 100.0

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.8

Formulation 2

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Weight Percent

:1

:3	Monoethanolamine lauryl ether sulphate	10.0
:4	Cocamido propyl amine oxide	1.2
5	**Bis (2-hydroxyethyl) tallow ammonium	
6	ethanoate	4.0
7	Glycerin	4.5
8	2-Nitro-p-phenylene diamine	0.3
9	4-Nitro-o-phenylene diamine	0.3
0	Perfume	qs
1	Preservatives	qs
2	Deionised water	qs to 100.0

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Formulation 3

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Weight Percent

Monoethanolamine lauryl ether sulphate	10.0
Linoleic diethanolamide	4.0
**Cocamido propyl betaine	4.0
Glycerin	4.5
2-Nitro-p-phenylene diamine	0.3
4-Nitro-o-phenylene diamine	0.3
Perfume	qs
Preservatives	qs
Deionised water	qs to 100.0

Formulation 4Weight Percent

Monoethanolamine lauryl ether sulphate	10.0
Linoleic diethanolamide	4.0
**Bis (2-Hydroxy ethyl) tallow ammonium ethanoate	4.0
Glycerin	4.5
2-Nitro-p-phenylene diamine	0.3
4-Nitro-o-phenylene diamine	0.3
Perfume	qs
Preservatives	qs
Deionised water	qs to 100.0

Note

\*\*Indicates the auxiliary surfactant in each of the above test formulation, omitted from the control formulations.

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04 Each tress (1g) was dampened with water then treated  
05 with a sample (1g) of a test or a control formulation  
06 and left for 10 minutes before rinsing with warm water  
07 and drying. The colour, shade, and intensity of  
08 tresses dyed with each test formulation was compared  
09 with that of the tresses dyed with the corresponding  
10 control formulation.

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### Results

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Formulation	Colour	Comparison with control formulation
1	Warm, hazel brown	Brighter colour, stronger red shade
2	Bright golden brown	More intense shade with gold highlights
3	Golden brown	More intense
4	Golden brown	More intense, with bright gold highlights

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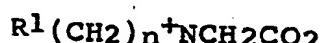
CLAIMS

1. A dye composition for treating hair, comprising an anionic shampoo base, auxiliary surfactant, and a direct dye.
2. A dye composition as claimed in claim 1, wherein the anionic shampoo base comprises a major proportion of an anionic surfactant and optionally additional anionic, non-ionic or cationic surfactants.
3. A dye composition as claimed in claim 1 or claim 2, wherein the auxiliary surfactant is a cationic or betaine surfactant, or is a mixture of such surfactants.
4. A dye composition as claimed in claim 3, comprising:  
from 0.01% to 10% by weight of a direct dye;  
from 0.1% to 50% by weight of an anionic surfactant; and  
from 0.1% to 50% by weight of a cationic surfactant; and/or  
from 0.1% to 50% of a betaine surfactant.

- 16 5. A dye composition as claimed in claim 3 or claim  
17 4 wherein the betain surfactant is a compound of  
18 the formula:-

19 R<sup>2</sup>

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2 |

3 R<sup>3</sup>

4 wherein;

5 R<sup>1</sup> is a C<sub>10-18</sub> alkyl group or a C<sub>9-17</sub> alkyl  
6 carbonylimino group;

7 R<sup>2</sup> is a C<sub>1-3</sub> alkyl group or a hydroxy C<sub>1-3</sub> alkyl  
8 group;

9 R<sup>3</sup> is a C<sub>1-3</sub> alkyl group or a hydroxy C<sub>1-3</sub> alkyl  
0 group;

1 and n is an integer from 1 to 5.

- 2 6. A dye composition as claimed in any one of claims  
3 3 to 5, wherein the betaine surfactant is a  
4 cocamido alkyl betaine.  
5  
6 7. A dye composition as claimed in claim 6, wherein  
7 the betaine surfactant is cocamido propyl betaine.  
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02     8. A dye composition as claimed in any one of claims  
03         1 to 7, wherein the direct dye is an  
04         anthraquinone, azo, nitro such as a  
05         nitrophenylene diamine, basic, triarylmethane, or  
06         disperse dye, or any combination thereof.  
07  
08     9. A dye composition as claimed in any one of claims  
09         1 to 9, wherein the dye or when a mixture of dyes  
10         is used, each dye is present in the composition at  
11         from 0.01 to 5% by weight.  
12  
13     10. A dye composition as claimed in any one of claims  
14         1 to 9, wherein the total dye content is in the  
15         range of 0.01 to 10% by weight.





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㉒ Date of filing: 01.08.84

㉔ Priority: 11.08.83 GB 8321653

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㉖ Date of publication of application: 17.04.85  
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㉚ Colouring shampoo.

㉛ A shampoo composition for treating hair, comprising a  
anionic shampoo base, auxiliary surfactant, and a direct  
dy , useful in dyeing natural fibres, and in particular for  
dyeing human hair.

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## EUROPEAN SEARCH REPORT

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Application number

EP 84 10 9141

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	FR-A-2 112 489 (UNILEVER N.V.) * Claims 1-4; example 2 * --- A FR-A-2 096 377 (H. CURTIS) * Claims 1-3 * --- A GB-A- 986 712 (CHESEBROUGH-POND'S INC.) * Claims 1-16 * -----	1-4, 8-10 1, 5-7 1, 5-7	A 61 K 7/13
TECHNICAL FIELDS SEARCHED (Int. Cl.4)			
A 61 K			
<p>The present search report has been drawn up for all claims</p>			
Place of search <b>THE HAGUE</b>	Date of completion of the search <b>24-04-1986</b>	Examiner <b>DECOCKER L.</b>	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
<b>X</b> : particularly relevant if taken alone <b>Y</b> : particularly relevant if combined with another document of the same category <b>A</b> : technological background <b>O</b> : non-written disclosure <b>P</b> : intermediate document			